# Muhammad **Akhtar Munir**

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## Summary

A self-motivated Ph.D. research fellow / Research Associate with background of computer science, research, and development. Hands on experience in developing algorithms and designing experiments for practical problems in computer vision and deep learning. Current research focuses on unsupervised domain adaptation, object detection, uncertainty estimation, model calibration, and remote sensing.

## Experience

- **Research Associate** at Mohamed Bin Zayed University of Artificial Intelligence (MBZUAI), Abu Dhabi, UAE.
  - **Duration:** July 2023 – Present (Computer Vision Department, MBZUAI)
- **Research Intern** at Mohamed Bin Zayed University of Artificial Intelligence (MBZUAI), Abu Dhabi, UAE.
  - **Duration:** August 2022 – June 2023 (Computer Vision Department, MBZUAI)
- **Research Associate** at Information Technology University (ITU) of Punjab, Lahore, Pakistan.
  - **Duration:** January 2022 – July 2022 (Under Google Research Scholar Award, ITU)
- **Ph.D. Fellow (Student)** at Information Technology University (ITU) of Punjab, Lahore, Pakistan.
  - **Duration:** September 2017 – Present (Lab: Intelligent Machines Lab, ITU)
- **Lab Engineer** at School of Electrical Engineering and Computer Science (SEECS), NUST, Islamabad, Pakistan.
  - **Duration:** November 2013 – August 2017 (Department of Computing, SEECS, NUST)

## Publications (Selected)

Sohail Danish, Muhammad Haris Khan, **Muhammad Akhtar Munir**, M. Saquib Sarfraz, and Mohsen Ali. "**Improving Single Domain-Generalized Object Detection: A Focus on Diversification and Alignment"** In IEEE/CVF Conference on Computer Vision and Pattern Recognition **(To appear in CVPR 2024)**

**Muhammad Akhtar Munir**, Salman Khan, Muhammad Haris Khan, Mohsen Ali, and Fahad Khan. "**Cal-DETR: Calibrated Detection Transformer"** In Conference on Neural Information Processing Systems **(NeurIPS 2023)**

**Muhammad Akhtar Munir**, Muhammad Haris Khan, M. Saquib Sarfraz, and Mohsen Ali. "**Domain Adaptive Object Detection via Balancing between Self-Training and Adversarial Learning**" In IEEE Transactions on Pattern Analysis and Machine Intelligence **(TPAMI 2023, IF=23.6)**

**Muhammad Akhtar Munir**, Muhammad Haris Khan, Salman Khan, Fahad Khan, "**Bridging Precision and Confidence: A Train-Time Loss for Calibrating Object Detection**", IEEE/CVF Conference on Computer Vision and Pattern Recognition **(CVPR 2023)**

**Muhammad Akhtar Munir**, Muhammad Haris Khan, M. Saquib Sarfraz, and Mohsen Ali. "**Towards Improving Calibration in Object Detection Under Domain Shift**" In Conference on Neural Information Processing Systems **(NeurIPS 2022)**

**Muhammad Akhtar Munir**, Muhammad Haris Khan, M. Saquib Sarfraz, and Mohsen Ali. "**SSAL: Synergizing between Self-Training and Adversarial Learning for Domain Adaptive Object Detection**" In Conference on Neural Information Processing Systems **(NeurIPS 2021)**

## Education

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|---|---|---|
| Sep'17-<br>Jun'24 | Doctor of Philosophy in Computer Science<br>**CGPA: 3.50/4.0** (Coursework)<br><br>*Courses:* Deep Learning, Computer Vision, Machine Learning, Probability & Stats | **Information Technology University, Lahore**<br><br>*Thesis: Domain Adaptation for Object Detection* |
| Feb'15-<br>Jun'17 | Master of Science in Computer Science<br>**CGPA: 3.84/4.0**<br><br>*Courses:* Artificial Intelligence, Digital Image Processing, Algorithms Analysis | **COMSATS Institute of Information Technology, Islamabad**<br><br>*Thesis: Ischemic Stroke Lesion Segmentation in MR Sequences Using MLP and SVM* |
| Feb'09-<br>Jan'13 | Bachelor of Science in Computer Engineering<br>**CGPA: 3.38/4.0** | **COMSATS Institute of Information Technology, Islamabad** |

## Programming Languages & Tools

- Python
- Deep Learning Frameworks **(PyTorch, Keras, Caffe, JAX)**
- C/C++
- MATLAB
- ArcGIS
- Linux
- Visual Studio Code
- Microsoft Office
- Latex

## Services & Honors

- **Reviewer: CVPR** 2024, **ICLR** 2024, **CVPR** 2023, **ICCV** 2023**, NeurIPS** 2023, **ACM Multimedia** 2021
- **Awardee: NeurIPS** 2022 & 2023 Scholar Award, **CVPR** 2023 DEI Award
- **Scholarship: PhD Fellowship,** from Information Technology University, Lahore, Pakistan
- **Summer School: EEML Summer School**, Virtual Budapest, Hungary, 2021

## References

**Dr Salman Khan,** Associate Professor,
Mohamed bin Zayed University of Artificial Intelligence (MBZUAI), Abu Dhabi, United Arab Emirates
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**Dr Muhammad Haris Khan,** Assistant Professor,
Mohamed bin Zayed University of Artificial Intelligence (MBZUAI), Abu Dhabi, United Arab Emirates
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**Dr Mohsen Ali,** Associate Professor,
Information Technology University (ITU) of Punjab, Lahore, Pakistan
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